STATE OF NEW MEXICO
BEFORE THE WATER QUALITY CONTROL COMMISSION

In the Matter of:	)	
PROPOSED AMENDMENT TO 20.6.2 NMAC (Dairy Rules)	)	**No.: WQCC 09-13 (R)**
New Mexico Environment Department, Petitioner.	)	

WRITTEN TESTIMONY OF SARAH MCGRATH

My name is Sarah McGrath, and I am the Agricultural Team Leader for the Ground Water Quality Bureau (GWQB) of the New Mexico Environment Department (NMED). I am submitting this written technical testimony on behalf of NMED in support of its petition for dairy industry specific rules filed with the Water Quality Control Commission ("WQCC") on January 29, 2010. My testimony provides background information concerning ground water contamination at dairy facilities in New Mexico. My testimony shows that ground water contamination is prevalent at dairy facilities.

I. BACKGROUND AND EXPERIENCE

I have been working in the Ground Water Pollution Prevention Section (GWPPS) of the GWQB for ten years. I hold the position of Agricultural Team Leader in which I have the responsibility of reviewing all dairy Discharge Permits for technical and regulatory completeness before they are issued by the GWQB. In addition, my duties include the development of internal

policies, guidelines, templates and special projects related to agricultural Discharge Permits. I supervise two staff directly. Also, my job duties include field inspections, enforcement actions, public meetings and public hearings. I hold a Bachelor's of Science degree in Watershed Management with minors in Soils and Geology from the University of Wisconsin - Stevens Point (NMED NOI Exhibit B).

II. INTRODUCTION

In accordance with existing WQCC Regulations for Ground Water Discharge Permits, dairy facilities in New Mexico are required to submit ground water quality data to the department on a quarterly basis. Dairy facilities are required by Discharge Permits to have monitoring wells located hydrologically upgradient of the dairy facility and hydrologically downgradient from potential sources of contamination such as wastewater impoundments, combination wastewater/stormwater impoundments, and fields within the land application area as described in the testimony of William Olson and George Schuman for Section 20.6.2.3223 NMAC of the proposed rule. The purpose of monitoring wells is to assess compliance with the ground water quality standards as described in the testimony of William Olson for Subsection A of 20.6.2.3223 NMAC. The summary provided in my testimony is based on data submitted by 168 dairy facilities to the department as required by their existing Discharge Permits.

III. SCOPE OF DATA EVALUATION

The scope of the evaluated ground water quality data focuses on dairy facilities that are actively discharging wastewater and those that have discharged wastewater in the past but are currently inactive. For the purposes of this evaluation, dairy facilities with nitrate-nitrogen

contamination in ground water are defined as those having nitrate-nitrogen concentrations in ground water in excess of the WQCC ground water standard of 10 mg/L (based on Subsection A of 20.6.2.3103 NMAC and herein referred to as "standard"), and having a greater concentration of nitrate-nitrogen in a downgradient monitoring well compared to the upgradient monitoring well, when upgradient well data is available.[1] Although the WQCC has also established standards for total dissolved solids and chloride, this evaluation focuses solely on whether dairy facilities exceed the standard for nitrate-nitrogen because it is a WQCC human health-based standard.

The purpose of monitoring wells required by Ground Water Discharge Permits is to assess compliance with the ground water quality standards as described in the testimony of William Olson for Subsection A of 20.6.2.3223 NMAC. These wells are not intended to define the vertical and horizontal extent of the ground water contamination from a facility, nor the magnitude. Please see the testimony of Bart Faris for examples of dairy facilities currently in abatement that are in the process of defining the vertical and horizontal extent, as well as the magnitude of ground water contamination from sources at their facilities.

IV. CURRENT QUARTERLY GROUND WATER QUALITY DATA

The most recent quarterly ground water quality data submitted by the 168 active and inactive dairy facilities as of December 2009 indicates that 57.1% of these dairy facilities have nitrate-nitrogen contamination in ground water from one or more contamination sources at the facility. The data also indicates that 37.5% of these dairy facilities do not currently have

[1] In instances where a dairy facility does not have a monitoring well located hydrologically upgradient of the dairy facility or in instances where data was not provided from the upgradient monitoring well, nitrate-nitrogen exceedances in downgradient monitoring wells are strictly attributed to contamination sources at the facility.

documented nitrate-nitrogen contamination in ground water from the contamination sources that are monitored. The remaining 5.4% of these dairy facilities do not have monitoring wells or were unable to collect a sample from the monitoring wells to assess the potential impacts on ground water quality from contamination sources at the dairy facility. (NMED Exhibit SKM -1, Figure 1 and Table 1)

Of the 96 dairy facilities (57.1 %) with nitrate-nitrogen contamination currently in ground water, the data indicates that 71.9% of these facilities exceed the standard for nitrate-nitrogen in wells intended to monitor wastewater or wastewater/stormwater combination impoundments. Additionally, of the 96 dairy facilities (57.1 %) with nitrate-nitrogen contamination currently in ground water, 60.4% of these facilities exceed the standard for nitrate-nitrogen in wells intended to monitor fields within the land application. Several dairy facilities have nitrate-nitrogen contamination in ground water from more than one contamination source at the facility. (NMED Exhibit SKM -1, Figure 2 and Tables 2 and 3)

In many cases, the liner history for impoundments is not well documented. It appears that many impoundments have been lined with manure, in-situ compacted earth, or clay. There are instances where one liner has replaced another in the same impoundment.

Within the last ten years, synthetic liners have been more widely used to replace the manure, in-situ compacted earth, and clay liners that have resulted in ground water contamination. Also, since 2002, synthetic liners have been more widely installed as the initial wastewater impoundment liner at new dairy facilities. Of new facilities that began discharging

from 2002 forward where the initial liner was synthetic, it is not common to see nitrate-nitrogen contamination in ground water in wells intended to monitor those impoundments.

V. ALL GROUND WATER QUALITY DATA FOR THE HISTORY OF DAIRY FACILITIES

An evaluation was conducted of all available ground water quality data for each of the 168 active and inactive dairy facilities. The data in NMED Exhibit SKM - 2 contains the single highest nitrate-nitrogen concentration in ground water ever documented at each dairy facility. The data does not include the highest concentration associated with each monitoring well; rather it contains only the single highest concentration of nitrate-nitrogen out of all monitored sources at the dairy facility.

The data indicates that 72% of these facilities have had nitrate-nitrogen contamination in ground water from at least one contamination source at some point in time during their history. The data also indicates that 24.4% of these dairy facilities have never had documented nitrate-nitrogen contamination in ground water from the contamination sources that are monitored. The remaining 3.6% of these dairy facilities do not have monitoring wells to assess the potential impacts on ground water quality from contamination sources at the facility. (NMED Exhibit SKM -2, Figure 1 and Table 1)

In evaluating the highest historical nitrate-nitrogen concentrations in ground water sampled from wells intended to monitor wastewater impoundments, stormwater impoundments,

and fields within the land application, it is not uncommon to find exceedances greater than 20 times the standard (i.e., more than 200 mg/L). (NMED Exhibit SKM – 2, Table 1)

VI. CLOSING

In closing, the majority of active and inactive dairy facilities in New Mexico have, or have had, nitrate-nitrogen contamination in ground water from one or more contamination sources at the facility. When nitrate-nitrogen contamination occurs at dairy facilities, the historical data indicates that exceedances of the WQCC ground water quality standard for nitrate-nitrogen can be more than 20 times the standard.